

## LETTERS



Afghanistan's unexplored mountains could hold hidden biodiversity.

Edited by Jennifer Sills

## Biodiversity research in a changing Afghanistan

In the second half of the 20th century, 90% of major armed conflicts took place in countries that fall in biodiversity hotspots (1). Afghanistan is not considered a biodiversity hotspot (2), but this designation may be inaccurate. Biodiversity research is thus desperately needed to add to our knowledge of the region.

Afghanistan has suffered from more than 40 years of political instability and civil war, hindering far-reaching conservation research activities (3). The golden age of Afghanistan's biodiversity research took place decades ago (4, 5), before the advent of DNA techniques used to evaluate biodiversity today. Afghanistan's biodiversity research is mostly based on museum collections assembled in the 1970s or before (6–8). Given the country's unique position, which is influenced by the Palearctic and Oriental biogeographical realms, and its habitat diversity, Afghanistan may hold a high level of hidden species and genetic diversity that are crucial for understanding the historical biogeography of Asia. Mountains have

driven past speciation events worldwide (9), yet the mostly mountainous Afghanistan has remained unexplored (6).

The first Afghan national park was established only 12 years ago, and others have followed, providing hope that wildlife research and conservation would contribute to the stability of the country (3, 10). Although these national parks are a step forward, we still have little information about the distribution of the country's diverse biota or the threats that they face. Many species are likely in circumstances similar to the endemic, critically endangered mountain salamander, *Paradactylodon (Afghanodon) mustersi*, which is virtually unprotected and at increased risk due to human activities (11).

Despite the ongoing unrest in Afghanistan (12), the Afghan government must prioritize biodiversity research. Taking each local security situation into account, the government should work together with local universities and conservation organizations to bridge gaps in biodiversity research and seek support from the international scientific community. Protected areas should be expanded, and local communities should be supported and empowered to safeguard them. Scientists should collaborate to reestablish and update natural history museum

collections, identify species-rich areas, assemble comprehensive checklists of biota, and create national distribution atlases for all known species, especially those that are endangered.

Daniel Jablonski<sup>1\*</sup>, Abdul Basit<sup>2</sup>, Javeed Farooqi<sup>3</sup>, Rafaqat Masroor<sup>4</sup>, Wolfgang Böhme<sup>5</sup>

<sup>1</sup>Department of Zoology, Comenius University in Bratislava, Bratislava, Slovakia. <sup>2</sup>Wildlife Conservation Society, Kabul, Afghanistan.

<sup>3</sup>Department of Zoology, University of Chitral, Chitral, Pakistan. <sup>4</sup>Zoological Science Division, Pakistan Museum of Natural History, Islamabad, Pakistan. <sup>5</sup>Department of Vertebrata, Zoological Research Museum Alexander Koenig, Bonn, Germany.

\*Corresponding author.  
Email: daniel.jablonski@uniba.sk

### REFERENCES AND NOTES

1. T. Hanson *et al.*, *Conserv. Biol.* **23**, 578 (2009).
2. C. C. Shank *et al.*, *Biodiversity Profile of Afghanistan* (United Nations Environment Programme, Kabul, 2008).
3. P. Smallwood *et al.*, *BioScience* **61**, 506 (2011).
4. C. N. Naumann, G. Nogge, *GAWI Newsletter* **73**, 25 (1973).
5. A. A. Nahif, *Bonn Zool. Bull.* **37**, 311 (1986).
6. P. Wagner *et al.*, *Proc. Calif. Acad. Sci.* **63**, 457 (2016).
7. D. Jablonski *et al.*, *ZooKeys* **843**, 129 (2019).
8. D. Jablonski, R. Masroor, *Bonn Zool. Bull.* **70**, 63 (2021).
9. C. Rahbek *et al.*, *Science* **365**, 1114 (2019).
10. E. Onion, "In Afghanistan, a new national park carries hopes for conservation and peace." *Mongabay* (2020).
11. S. N. Stuart *et al.*, Eds., *Threatened Amphibians of the World* (International Union for the Conservation of Nature, Gland, Switzerland, 2008).
12. S. Worden *et al.*, "U.S. Withdrawal from Afghanistan: End to an Endless War?," *United States Institute of Peace* (2021).

10.1126/science.abj8118